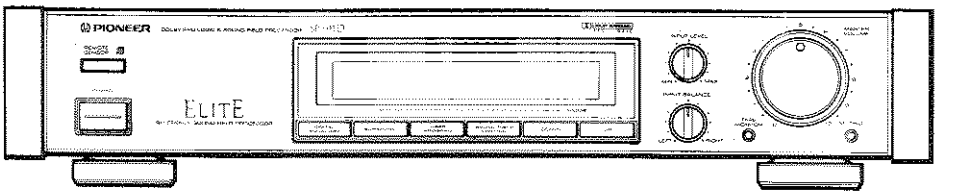
Operating Instructions

DOLBY PRO LOGIC & SOUND FIELD PROCESSOR

SP-91D



Thank you for buying this fine Pioneer product. For the most effective performance of all the functions of this unit, please read this operation manual carefully before using. Store this manual in a safe place together with warranty and service center information for future reference.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

IMPORTANT NOTICE

[For U.S. and Canadian models]

The serial number for this equipment is located on the rear panel. Please write this serial number on your enclosed warranty card and keep in a secure area. This is for your security.

[For Canadian model]

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

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PIONEER®
The future of sound and vision.

IMPORTANT

The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION:
TO PREVENT THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

SAFETY INSTRUCTIONS

READ INSTRUCTIONS – All the safety and operating instructions should be read before the appliance is operated.

RETAIN INSTRUCTIONS – The operating instructions should be retained for future reference.

HEED WARNING – All warnings on the appliance and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS – All operating and use instructions should be followed.

WATER AND MOISTURE – The appliance should not be used near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

LOCATION – The appliance should be installed in a stable location.

WALL OR CEILING MOUNTING – The appliance should not be mounted to a wall or ceiling.

VENTILATION – The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings, or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

HEAT – The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

POWER SOURCES – The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

POWER-CORD PROTECTION – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

POLARIZATION – If your purchased product is provided with a polarized power plug, please read the following instructions. This product is equipped with a polarized alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

CLEANING – The appliance should be cleaned only with a polishing cloth or a soft dry cloth. Never clean with furniture wax, benzine, insecticides or other volatile liquids since they may corrode the cabinet.

POWER LINES – An outdoor antenna should be located away from power lines.

NONUSE PERIODS – The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

OBJECT AND LIQUID ENTRY – Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

DAMAGE REQUIRING SERVICE – The appliance should be serviced by a Pioneer authorized service center or qualified service personnel when:

- The power-supply cord or the plug has been damaged; or
- Objects have fallen, or liquid has been spilled into the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a marked change in performance; or
- The appliance has been dropped; or the enclosure damaged.

SERVICING – The user should not attempt to service the appliance beyond that described in the operating instructions. For all other servicing, contact the nearest Pioneer authorized service center.

OUTDOOR ANTENNA GROUNDING – If an outside antenna is connected to the antenna terminal, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges.
In the U.S.A. section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Fig. A.

CART – An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

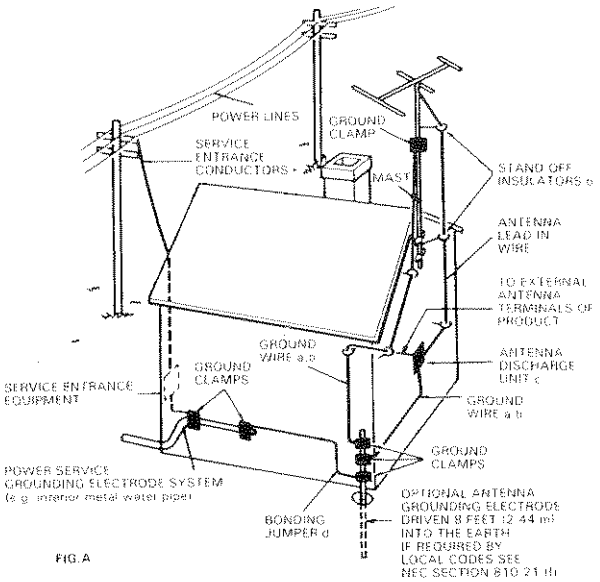

POWER LINES
GROUND CLAMP
SERVICE ENTRANCE CONDUCTORS
MAST
STAND OFF INSULATORS b
ANTENNA LEAD IN WIRE
TO EXTERNAL ANTENNA TERMINALS OF PRODUCT
GROUND WIRE a,b
GROUND CLAMPS
ANTENNA DISCHARGE UNIT c
SERVICE ENTRANCE EQUIPMENT
GROUND WIRE a,b
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (e.g. interior metal water pipe)
BONDING JUMPER d
OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44 m) INTO THE EARTH IF REQUIRED BY LOCAL CODES SEE NEC SECTION 810-21 (f)

FIG.A

a) Use No.10 AWG (5.3 mm²) copper, No.8 AWG (8.4 mm²) aluminum, No.17 AWG (1.0 mm²) copper-clad steel, bronze wire, or larger as ground wire.

b) Secure antenna lead in and ground wires to house with stand-off insulators spaced from 4 feet (1.22 meters) to 6 feet (1.83 meters) apart.

c) Mount antenna discharge unit as closely as possible to where lead in enters house.

d) Use jumper wire not smaller than No.6 AWG (13.3 mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used.
See NEC Section 810-21 (j).

[For Canadian model]

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

[Pour le modèle Canadien]

L'interférence, radioélectrique générée par cet appareil numérique de type B ne dépasse pas les limites énoncées dans le Règlement sur les perturbations radioélectriques, section appareil numérique, du Ministère des Communications.

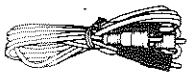
FEATURES

- Provides 8 Surround effect and 16 Sound Field Control programs.
- Using original high performance DSP technology, I.E.R.S (Integrated Early Reflection System) provides four extremely realistic sound field programs..... HALL 1, HALL 3, JAZZ 4, ROOM 1.
- Program parameters, sound effect levels, and optional balance settings for 16 original programs can be stored in memory.
- You can create just the sound you want with the Digital Equalizer.
- Equipped with a test tone generator to enable accurate setting adjustment.
- The supplied remote control unit allows you to operate the unit without moving from the listening position.

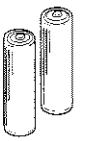
BEFORE USE

■ Check the accessories

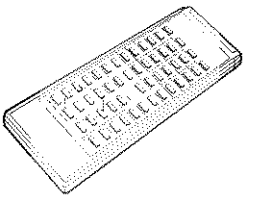
Audio cords 4



Size AAA, R03/UM-4 batteries ... 2

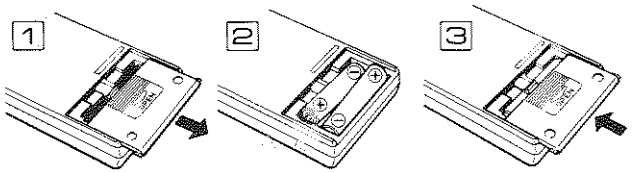


Remote control unit 1



■ Loading the remote control unit with batteries.

1. Open the cover of the battery case on the back of the remote control unit by pulling in the direction indicated by the mark while pressing.
2. Take two of the supplied Size AAA, R03/UM-4 batteries and insert as shown in the battery case.
3. Close the battery case cover.

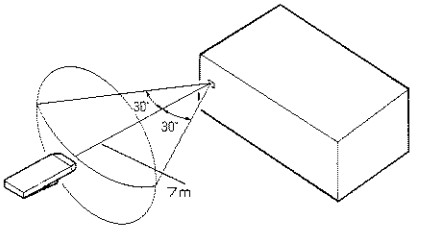


Using the batteries incorrectly may cause them to leak or burst. Pay careful attention to the following points.

1. Insert the two batteries making sure they are aligned with the polarity markings in the battery case.
2. Don't use a new battery with an old one.
3. Batteries of the same size may have different voltages so don't use different kinds of batteries together.

Range of Operation of the Remote Control Unit

The remote control unit can operate the main unit within a distance of 7 meters, and within an angle no more than 30 degrees off-axis from the infrared receiver.



INFORMATION TO USER [FOR U.S. MODEL]

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate this equipment with respect to the receiver
- move this equipment away from the receiver
- plug this equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

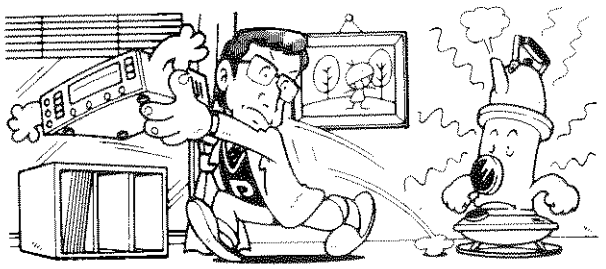
This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

The above instructions apply only to units which will be operated in the United States.

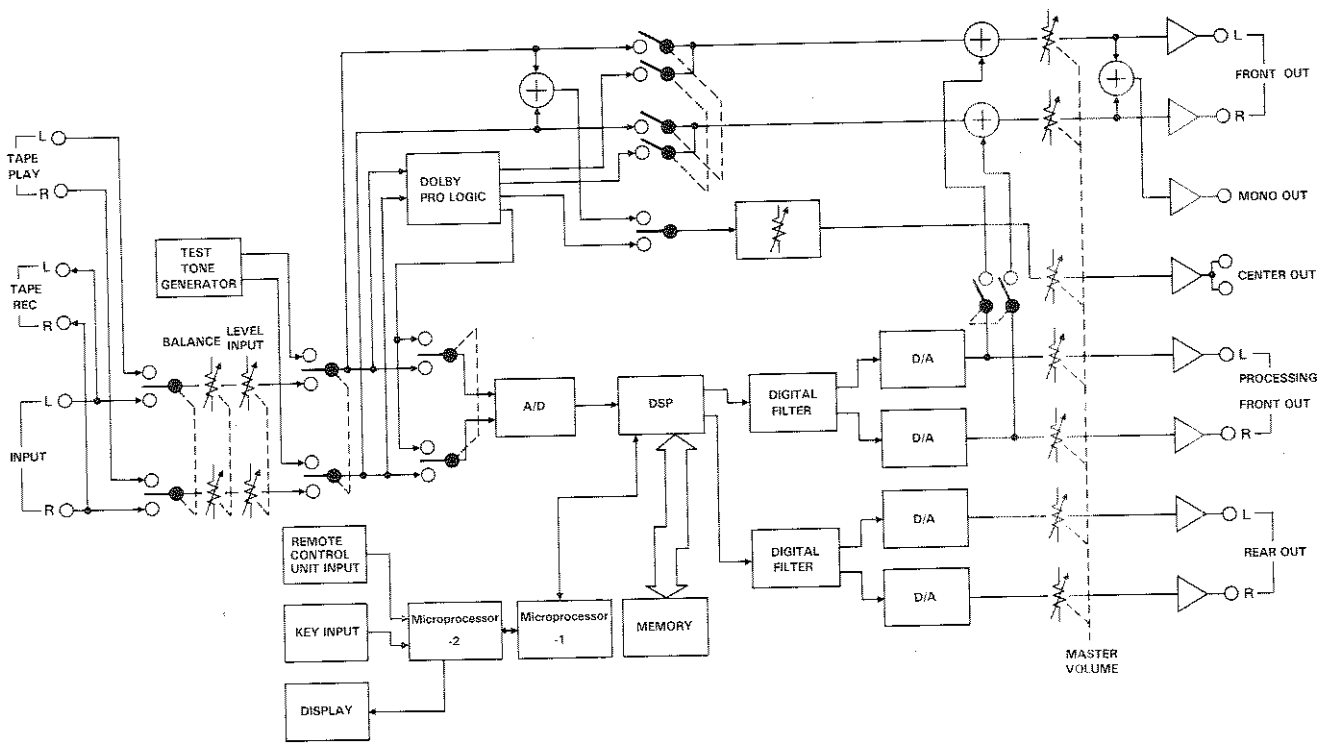
PRECAUTIONS BEFORE OPERATING

Install in a well ventilated location and avoid high temperatures and high humidity

o avoid damage to the cabinet or internal parts, do not install near heat ources such as stoves or other heat producing appliances, or in ocations that receive direct sunlight. Installing in hot, humid, steamy, moky, or dusty locations, or near furniture, may also lead to damage r accidents.



BLOCK DIAGRAM



ABOUT SOUND FIELD CONTROL

The sound you hear at a concert differs depending on the listening environment and your listening position. This is because sympathetic resonances and sounds reflected from the ceiling and walls reach your ears at different times, from different directions. With this unit, computer simulation lets you experience the sensation of listening to any genre of music in the most suitable acoustic environment. There is a choice of 24 preset sound field programs, which include 8 Surround settings.

■ HALL (1) to (4)

You can enjoy a convincing hall sound whether you are listening to a small orchestra or a full symphony orchestra.

■ JAZZ (1) to (4)

This gives you the sound field of a jazz club or an intimate nightclub.

■ DISCO (1) and (2)

A "hot" high-energy sound, with extra reverb for greater ambience.

■ ROCK (1) and (2)

This reproduces the exciting atmosphere of a live concert.

■ ROOM (1) and (2)

With this you can enjoy the simulated sound of a comfortable listening room.

■ CHURCH

The sound field of a church, ideal for reproducing the rich sound of a pipe organ.

■ DELAY

In this mode, sounds with different volume levels and degrees of delay are output through different speakers to create a spacious effect when used in conjunction with the main speaker.

This unit is equipped with a Dolby Surround Processor that uses digital delay circuitry to produce a more spacious sound field with greater presence.

■ DOLBY PRO LOGIC SURROUND

Use this effect for movie soundtrack sources, particularly those bearing the DD DOLBY SURROUND mark. You get the impression of actually being in a movie theater or at a concert. The standard delay time for DOLBY SURROUND is 20ms.

■ DOLBY 3 CHANNEL LOGIC

This adds the rear speaker signal to the front speakers to simulate the PRO LOGIC effect through the three front channels (front L, R, and Center).

■ STADIUM

Use this effect when watching live sports broadcasts such as baseball or football, and you will feel as though you are right there in the stadium.

■ SIMULATED SURROUND (1), (2)

Select this effect with monaural sources such as ordinary TV to create a wide, spacious sound. It can also be used with stereo sources.

■ THEATER (1), (2)

These effects are ideal when you want to enjoy stereo movie soundtrack sources that don't bear the DD DOLBY SURROUND mark.

■ STUDIO

This recreates the effect of listening to a performance in a comparatively small place, such as a studio or small hall.

When listening to monaural sources, enjoy the effect of SIMULATED SURROUND. If you use anything other than SIMULATED SURROUND 1, 2, in the Surround mode when listening to a monaural source, there will be no sound from the rear speaker.

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NOTE:
When reproducing the DOLBY SURROUND effect, be sure to adjust the DOLBY SURROUND input balance (refer to "PRELIMINARY OPERATIONS" on page 13).

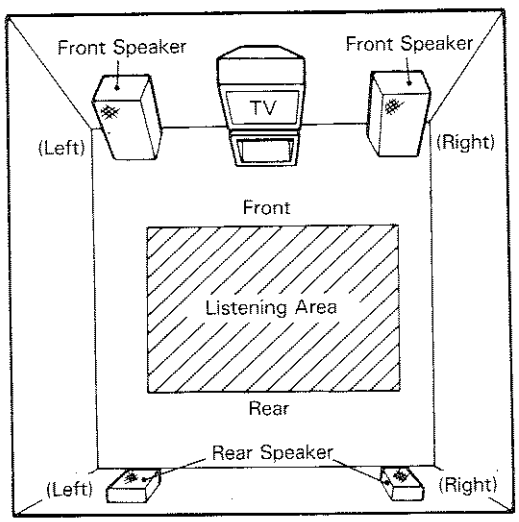
PLACING THE SPEAKERS

For the best sound field control effect, set up your speakers as shown in the figure below.

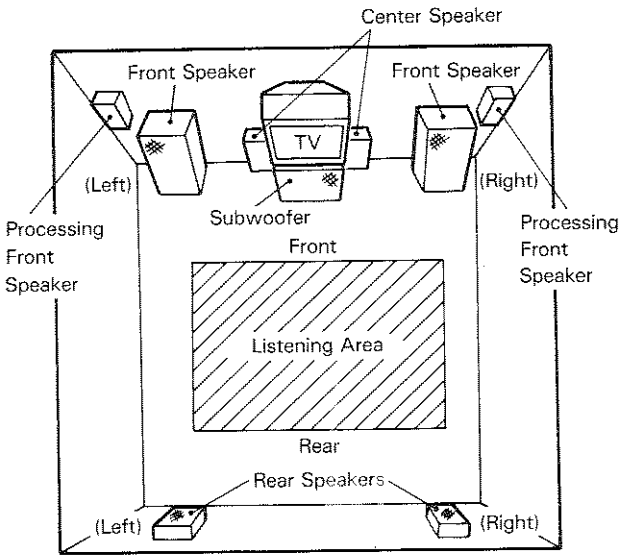
NOTE:

- *Speakers placed very close to a TV should be magnetically shielded.*
- *Place the left and right speakers at equal distances from the TV.*
- *When using only one center speaker, place it above the TV. If you place it at the side of the TV, the sound and the picture may not seem quite synchronized.*
- *It is more effective if the rear speakers and processing front speakers are positioned slightly higher than the level of your ears when listening.*
- *It is recommended you use amps and speakers that are matched in output and efficiency.*

Basic Setup



Example of an Expanded Setup



Placing the center speakers between two widely spaced front speakers assures much clearer orientation of speech or vocals.

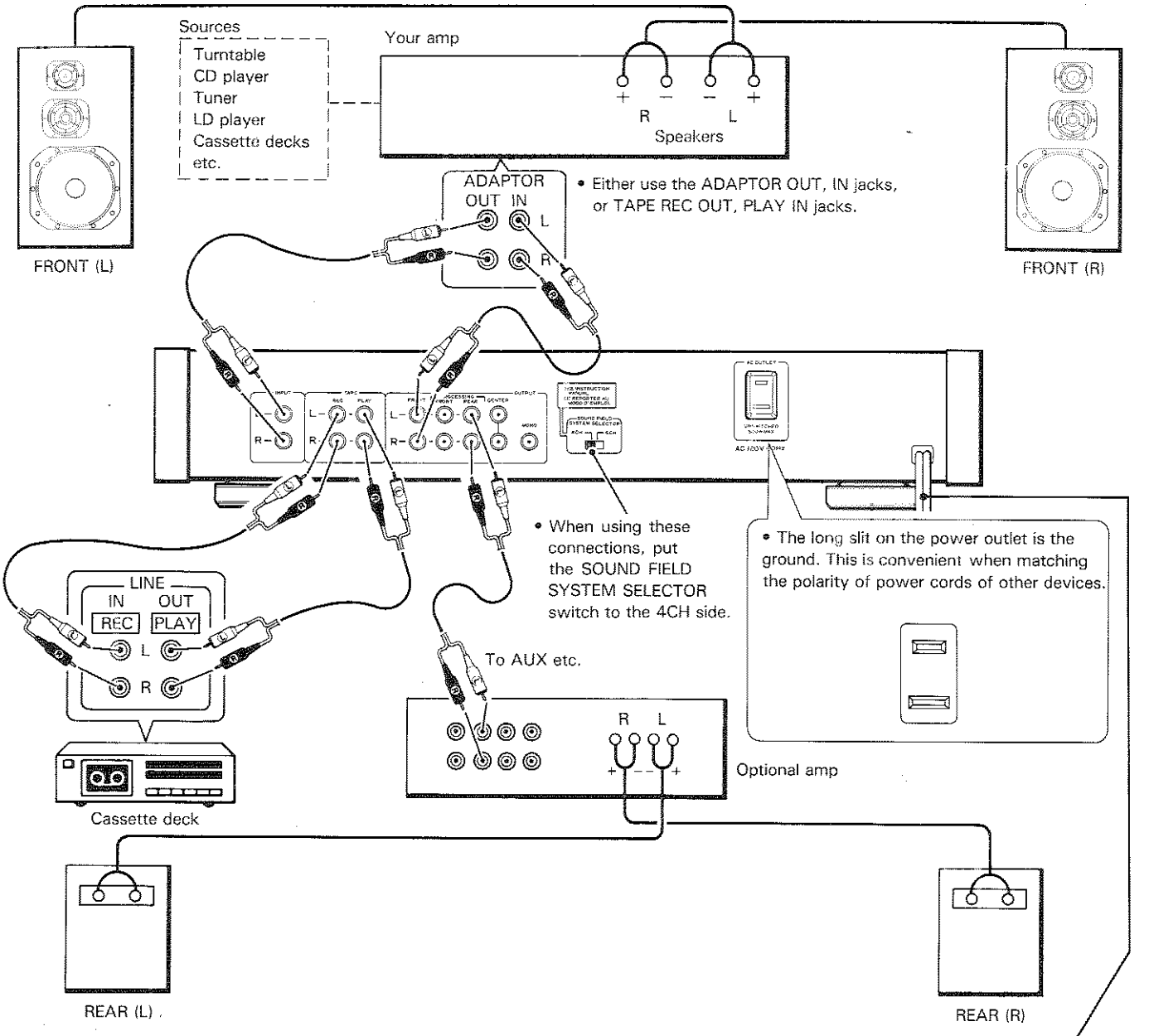
CONCERNING THE LISTENING ROOM

The best effect cannot be obtained from this unit if there are a lot of sound reflections in the room. If your room suffers from this problem, take the following measures

- In a room where sound reflections and vibrations are easily generated, use thick woolen curtains or try moving furniture to different positions.
- In a room with hard, rigid walls or glass doors, prevent generation of reflections and standing waves by using thick woolen curtains.

CONNECTING

THE EASIEST WAY TO ENJOY THE SOUND FIELD EFFECTS



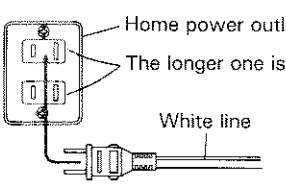
SOUND FIELD SYSTEM SELECTOR switch

When not using the front processing speaker, put this switch in the 4CH position and the processing front output will be mixed with the front main speaker output. This means you can still enjoy Sound Field Control playback even with only four speakers.

- If you aren't using the center speaker, when using DOLBY SURROUND and DOLBY 3CH LOGIC with these connections, switch the CENTER MODE to PHANTOM (See page 21).

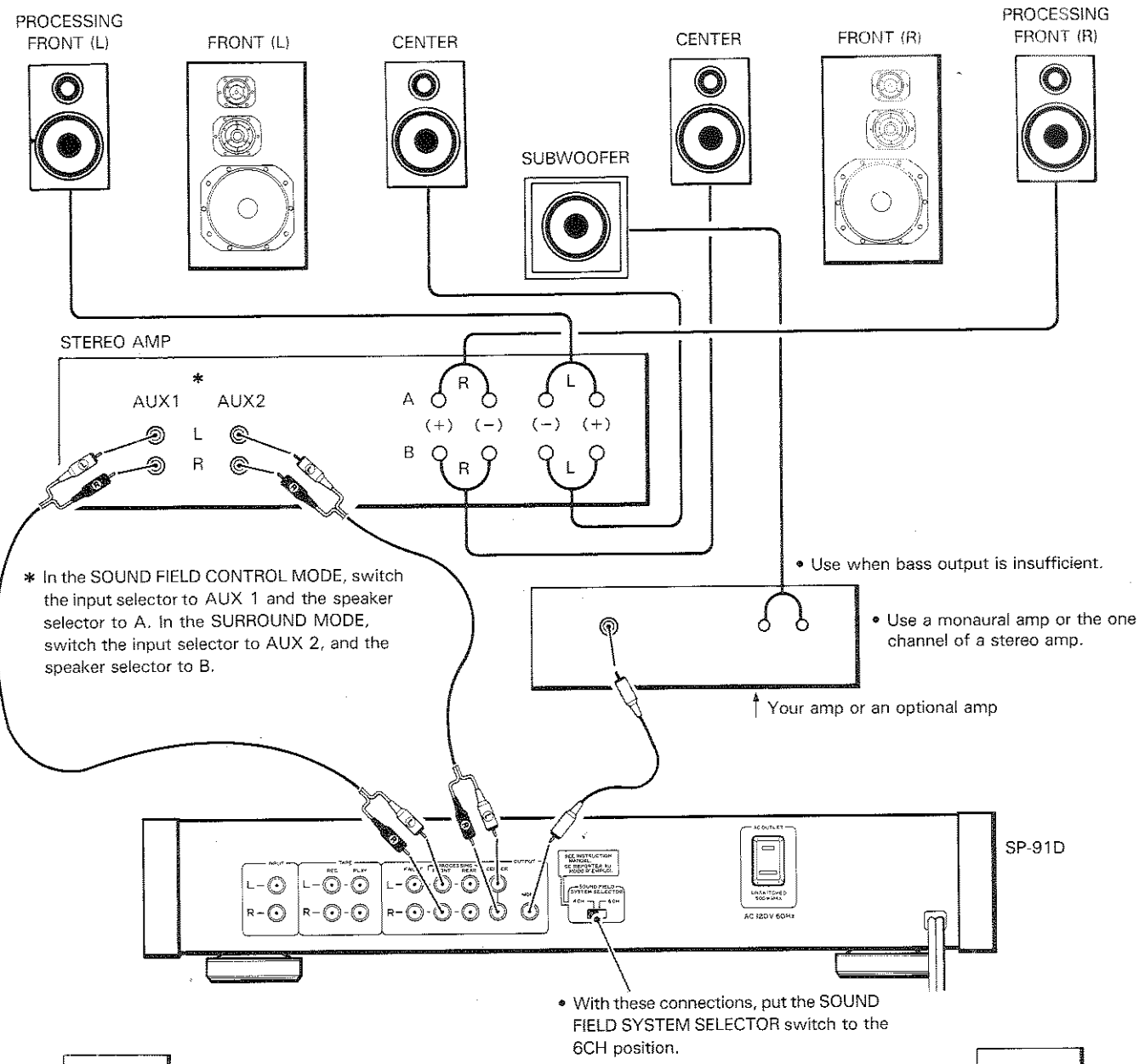
■ Connecting the Power Cord

Home AC power outlets have polarity, and are grounded. This unit takes advantage of this polarity to improve sound quality. As shown in the figure, insert the pin on the side of the power cord marked with a white line into the longer of the two slits.



ENJOY THE FULL SOUND FIELD EFFECT

This is the same setup as on the previous page, but additionally using two amps, two processing front speakers, center speakers, and a subwoofer.

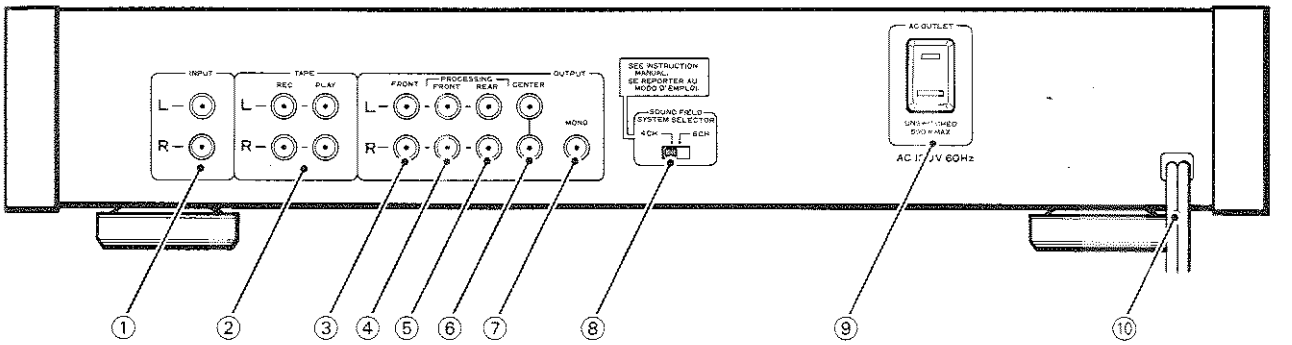

PROCESSING FRONT (L)
FRONT (L)
CENTER
SUBWOOFER
CENTER
FRONT (R)
PROCESSING FRONT (R)
STEREO AMP
*
AUX1
AUX2
L
R
A
B
R
L
(+) (−) (−) (+)
* In the SOUND FIELD CONTROL MODE, switch the input selector to AUX 1 and the speaker selector to A. In the SURROUND MODE, switch the input selector to AUX 2, and the speaker selector to B.
• Use when bass output is insufficient.
• Use a monaural amp or the one channel of a stereo amp.
Your amp or an optional amp
SP-91D
• With these connections, put the SOUND FIELD SYSTEM SELECTOR switch to the 6CH position.
REAR (L)
REAR (R)

To connect power amps to this unit:

- If directly connecting a power amp that has no volume control to the front output, use power amps for the processing front, rear, center, and mono outputs that have nearly the same amount of power as that of the power amp used for the front output.
- In order to obtain effective sound field balance, volume control should be a capability of the power amps or integrated amps connected to outputs other than the front output.

PANEL FEATURES AND FUNCTIONS

REAR PANEL



① Audio Input Jacks (INPUT)

Connect to a stereo amp's audio output jacks (such as an adaptor output or tape deck recording output).

② Tape Jacks (TAPE)

Record (REC): Connect to a cassette deck's record input jacks.
Playback (PLAY): Connect to a cassette deck's playback output jacks.

③ Front Output Jacks (FRONT)

Connect to a stereo amp's input jacks (such as an adaptor input or tape playback input).

NOTE:
If you connect the audio input and front output jacks of this component to a stereo amp, use the stereo amp's tape monitor jacks and switch the TAPE MONITOR switch ON.

④ Processing Front Output Jacks (PROCESSING FRONT)

Connect to a stereo amp's audio input jacks for processing front speakers.

⑤ Processing Rear Output Jacks (PROCESSING REAR)

Connect to the audio input jacks of the stereo amp used to drive the processing rear speakers.

⑥ Center Output Jacks (CENTER)

These are used as front center output. Connect to the amp used to drive the center speakers. Because the left and right signals output through these jacks are the same, so it is possible to use only one channel.

⑦ Mono Output Jack (MONO)

This mixes and outputs left and right channel audio signals. If the bass sound is insufficient, connect to an amp that drives the subwoofer. Output level is linked only to the master volume.

⑧ SOUND FIELD SYSTEM SELECTOR

When controlling the sound field without the processing front speakers, switch to the 4CH position. In general, leave it in the 6CH position.

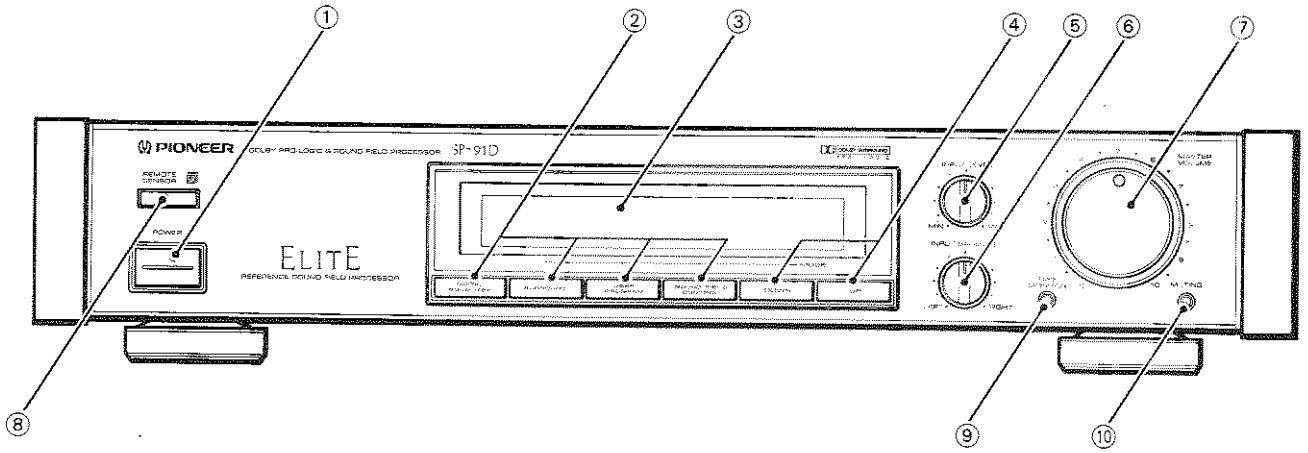
⑨ Power Outlet (UNSWITCHED, 500W or MAX)

- Regardless of whether this unit's power switch is turned off or on, power is supplied at all times directly to the unit plugged into this outlet. (Therefore, use the ON-OFF power switch of the connected component to turn it on and off.)
- Be careful that the power consumption of the component connected to this unit does not exceed 500W.

NOTE:
- *This unit should be disconnected by removing the power plug from the wall socket when not in regular use, e.g. when on vacation.*
- *Do not connect appliances with high power consumption such as heaters, irons, or television sets to these AC OUTLETS in order to avoid overheating and fire risk.*
  This can cause the receiver to malfunction.

⑩ Power Cord

FRONT PANEL



① POWER switch

Press to switch the power ON. Press again to switch the power OFF.

② Function switches

DIGITAL EQUALIZER: Only the remote control unit can be used to control equalization of seven frequency bands (65Hz, 160Hz, 400Hz, 1kHz, 2.5kHz, 6.5kHz, 12.5kHz). (See page 23)

SURROUND : this switches sound field reproduction to SURROUND.

USER PROGRAM : For playback with memorized user programs.

SOUND FIELD CONTROL: Press for reproduction of one of the unit's 16 internal sound field programs.

③ Operation Display (See page 11)

④ MODE switch

UP, DOWN switches: Use these to call up the desired program from the above three functions (excluding DIGITAL EQUALIZER). Pressing the UP switch gives you the next program, and the DOWN switch takes you back to the previous program No.

⑤ INPUT LEVEL

Adjust as necessary to accommodate the PREOUT level of the amp connected to the INPUT jack. In general, leave it in the center position. If the overload indicator lights, turn in a counterclockwise direction until the overload indicator goes out.

⑥ INPUT BALANCE

For adjustment of left and right speaker volume levels.

LEFT : Turn to the left when the volume from the left speaker is lower than that from the right speaker.

RIGHT : Turn to the right when the volume from the right speaker is lower than that from the left speaker.

NOTE:

When playing back in the SURROUND mode, follow procedure in "PRELIMINARY OPERATIONS" on page 13.

⑦ MASTER VOLUME

This adjusts the overall volume level.

⑧ REMOTE SENSOR

When using the supplied remote control unit, point it at this sensor.

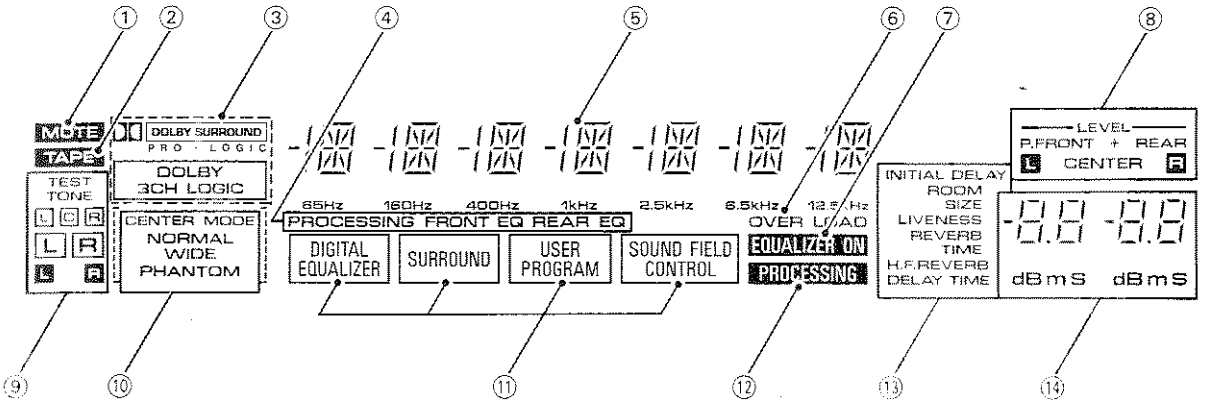
⑨ TAPE MONITOR switch

Press when playing back from a cassette deck or other component connected to the REC/PLAY jacks on the rear panel.

⑩ MUTING switch

Press to temporarily stop sound output. Press again to resume listening.

OPERATION DISPLAY



① MUTE Indicator

This lights when muting is ON.

② TAPE Indicator

This lights when the unit's tape monitor switch is ON.

③ DOLBY SURROUND Indicator

This displays DOLBY PRO LOGIC SURROUND and DOLBY 3CH LOGIC programs in the SURROUND MODE.

④ PROCESSING EQ Indicator

This displays the EQ changes that can be made to the processing front or rear.

⑤ When not displaying DIGITAL EQ level adjustments for different frequency bands, the contents of the program are displayed.

⑥ OVERLOAD Indicator

This lights if the INPUT level jack is too high.

⑦ EQUALIZER ON Indicator

This lights if the EQ ON/OFF key on the remote control unit is pressed. It also lights when playing an equalized sound.

⑧ This displays the channel being controlled and its contents in the indicators ⑬, ⑭.

⑨ TEST TONE Indicator

The channel outputting the test tone (pink noise) lights.

⑩ CENTER MODE Indicator

This lights when a DOLBY SURROUND or DOLBY 3CH LOGIC program is selected. Each time you press the CENTER MODE key on the remote control unit, the setting switches among NORMAL → WIDE → PHANTOM → OFF. The light goes out when the setting is OFF.

⑪ Function Indicator

DIGITAL EQUALIZER, SURROUND, USER PROGRAM, and SOUND FIELD CONTROL light when selected with the function switch.

⑫ Processing Indicator

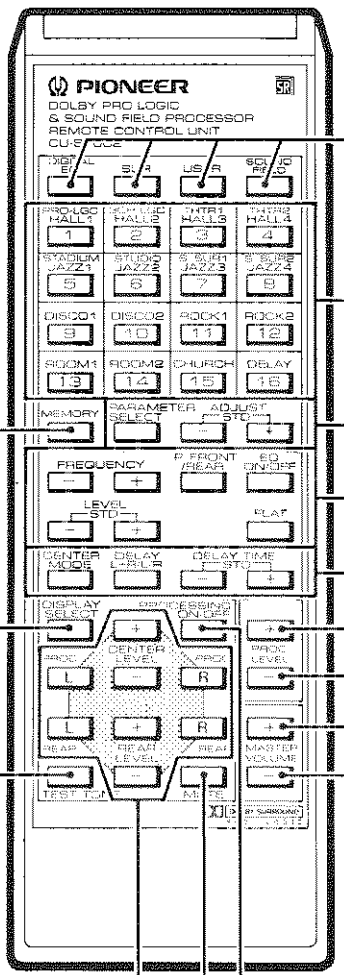
When the PROCESSING ON/OFF key on the remote control unit is pressed, this lights.

⑬ Parameter Indicator

Each time the remote control unit PARAMETER SELECT key is pressed, successive parameters are lit. Depending on the program, certain parameters may not be lit.

⑭ This shows the degree of change in parameter levels (See page 16).

REMOTE CONTROL UNIT



Function keys

Select one from Digital Equalizer, Surround, User Program, and Sound Field Control.

Program keys

Select the desired sound field program from the 16 Sound Field Control or 8 Surround programs. Or use to call up user program memory.

Parameter Setting keys

PARAMETER SELECT key:
Selects the type of parameter.
ADJUST (+, –) keys:
Change parameter values. Press both keys at the same time to return to the standard (STD) values.

Equalizer Control keys

FREQUENCY (+, –) keys:
Select the frequency band to be equalized.
LEVEL keys:
Change the level of the selected frequency bands. Press the +, – keys at the same time to return to the standard (STD) values.
P.FRONT/REAR key:
Switches between Processing Front and Rear.
EQ ON/OFF key:
Switches the equalizer ON and OFF.
FLAT key:
Returns adjusted equalization patterns to the flat setting.

Surround keys

CENTER MODE key:
When using DOLBY PRO LOGIC or DOLBY 3CH LOGIC, the setting changes among NORMAL → WIDE → PHANTOM → OFF each time it is pressed.
DELAY L+R/L/R key:
Selects delay time of L and R together, only L or only R.
DELAY TIME keys (+, –):
Changes delay time values. Pressing the + and - keys at the same time returns you to the standard (STD) delay time value.

PROCESSING LEVEL keys

(+, –): Increase or decrease the level of effect sound.

MASTER VOLUME keys

(+, –): Increase or decrease the overall volume level.

PROCESSING ON/OFF key

When this is off, the reflected sound, equalizer, and other effects are cut, and only the original sound is reproduced.

TEST TONE key

Switches the TEST TONE ON/OFF.

DISPLAY SELECT key

Switches the operation display.

MEMORY key

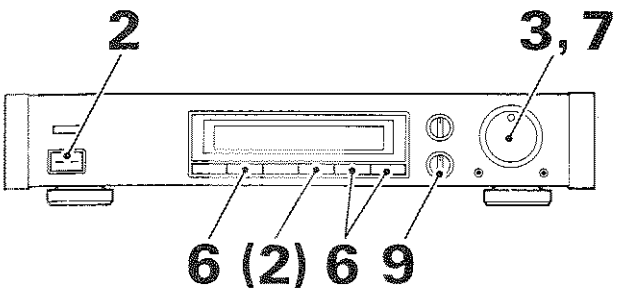
Press when memorizing parameter settings or effect sound levels to the User Program.

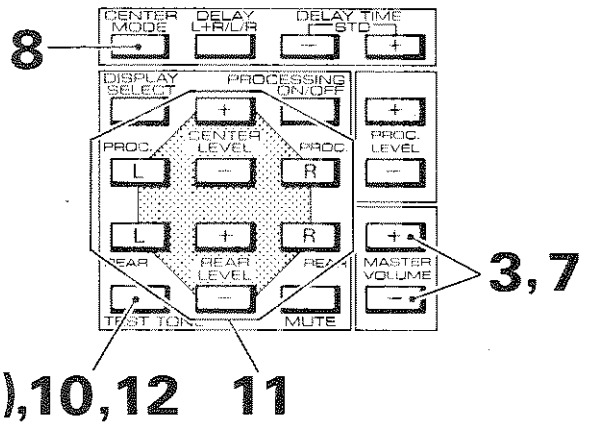
LEVEL keys

Use when balancing volume levels (See page 13).

MUTE key

Press to temporarily cut out sound.





[Listening with SURROUND]

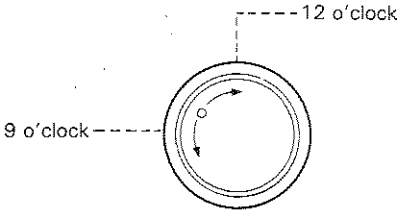
1. **Switch on the power to the amp and other components in your system.**

2. **Switch on the power to this unit.**
   If this unit's power switch is ON, and the power cord is connected to an amp's switched power outlet, the power to the unit can be switched on and off with the amp's power ON/OFF switch.

3. **Lowering the Unit's Output Level**
   Turn down the MASTER VOLUME knob (counterclockwise).

4. **When this unit is connected to an amp's adaptor jacks or tape monitor jacks, the amp's adaptor switch or tape monitor switch should be in the ON position.**

5. **Put the volume control knobs of all the amps in the usual listening position.**
   The volume knobs should be set between 9 and 12 o'clock.



For correct reproduction of the surround effect, be sure to carry out the following adjustments.

6. **Select SURROUND with the function key, and select DOLBY PRO LOGIC SURROUND with the UP, DOWN switches on the main unit, or the program keys on the remote control unit.**

7. **Play a monaural source, and put the MASTER VOLUME in the usual listening position.**

8. **Select OFF with the CENTER MODE key. (The center mode indication is then off.)**

9. **Adjust the INPUT BALANCE knob to the position that gives minimum volume from the front and rear speakers.**

10. **Adjust the volume level balance for all speakers. (Select the center mode to match the system you are using.)** **See page 21.**
    Press the TEST TONE key on the remote control unit, and you can hear the test tone.

    • The test tone can be heard in the order as follows.

    FRONT (L)→CENTER (C)→FRONT (R)→REAR (L) + (R)→FRONT (L) ...

    • When DOLBY PRO LOGIC SURROUND and DOLBY 3CH LOGIC without using a center speaker with the center mode switched to PHANTOM, center output is output through the front speakers.

    • With the test tone, adjust the volume level of all the speakers to until the levels are the same with the volume control of the amp they are connected.

11. **After adjustment, stop the test signal by pressing the remote control unit TEST TONE key.**

12. **Precise adjustment of level balance.**
    Select a listening position, and carry out precise adjustment with the remote control unit. There may be some difference in levels due to the position of the speakers, so adjust while playing back a source of your choice.
    With balance adjustment finished, you have completed all the preliminary operations required before actual music reproduction. Make any further volume adjustments with the MASTER VOLUME control.

    • When the processing level is 0 dB (max.), the effect sound level cannot be raised the beyond present level. Adjust with the volume control of the connected amp.

[Listening with SOUND FIELD CONTROL]

(1) Follow steps 1 through 5 of the "Listening with SURROUND" procedure.

(2) Use FUNCTION controls to select SOUND FIELD CONTROL.

(3) Adjust the volume level balance for all speakers.

Press the TEST TONE key on the remote control unit, and you can hear the test tone.

- The test tone can be heard in the order as follows.

FRONT (L) + (R) →PROCESSING FRONT (L) + (R) →REAR (L) + (R) →FRONT (L) →FRONT (R) →PROCESSING FRONT (L) →PROCESSING FRONT (R) →REAR (L) →REAR (R) →FRONT (L) + (R) ...

- Without using the processing front speakers, when the SOUND FIELD SYSTEM SELECTOR on the main unit is in the 4 CH position, processing front output is output through the front main speaker.

- With the test tone, adjust the volume level of all the speakers to until the levels are the same with the volume control of the amp they are connected.

(4) Follow steps 11 and 12 of the "Listening with SURROUND" procedure.

About test tone

- The test tone only operates when the function is SOUND FIELD CONTROL and when the DOLBY PRO LOGIC program is selected in the SURROUND mode.

- The test tone operates when the PROCESSING ON/OFF key of the remote control unit is ON.

NOTE:

- *When using this unit connected to an integrated amp, set the MASTER VOLUME to a position less than 12 o'clock.*

- When the function is Sound Field Control, the PROC. LEVEL key changes the processing front and rear levels at the same time. When the function is SURROUND, it changes the center and rear levels at the same time.

- When adjusting PROCESSING FRONT or REAR L R balance, if the level of the channel being controlled becomes the same as the other channel, the level of the other channel will decrease.

FUNCTIONS

In this unit there are 24 preset sound field programs, 16 in the Sound Field Control mode, and 8 in the SURROUND mode. You can call up the ideal sound field program for the source you wish to listen to.

1. FUNCTION SELECTION

The four following modes are available.

① SOUND FIELD CONTROL

These programs were computer simulated of actual sound field data of famous concert halls and jazz clubs around the world.
The SOUND FIELD CONTROL MODE can be called up by pressing the SOUND FIELD CONTROL key on either the main unit or the remote control unit.

Main unit

Remote control unit

② USER PROGRAMS

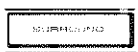
In this mode, you can call up programs you yourself have made (User programs) and stored in memory, or you can call up the patterns of digital equalizer. When the unit leaves the factory, the memorized programs for this mode are exactly the same as those in the Sound Field Control mode.
To call up the USER PROGRAM MODE, press the USER PROGRAM key on either the main unit or the remote control unit. Surround and digital equalizer can be included in user program memory, and is explained later in this manual.

Main unit

Remote control unit

③ SURROUND

With such sources as movie sound tracks or live sports broadcasts, this mode provides the effect of actually being in a movie theater or sports arena.
To call up the SURROUND mode, press the SURROUND key on either the main unit or the remote control unit.

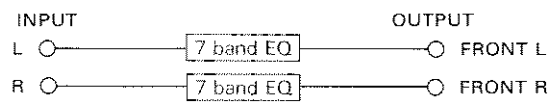

Main unit

Remote control unit

④ DIGITAL EQUALIZER

In the same way as an ordinary graphic equalizer, the front 2 CH can be equalized.
To call up the Digital Equalizer, press the DIGITAL EQUALIZER key on the main unit or the remote control unit.

- You can enjoy 2CH stereo equalization as shown in the figure.

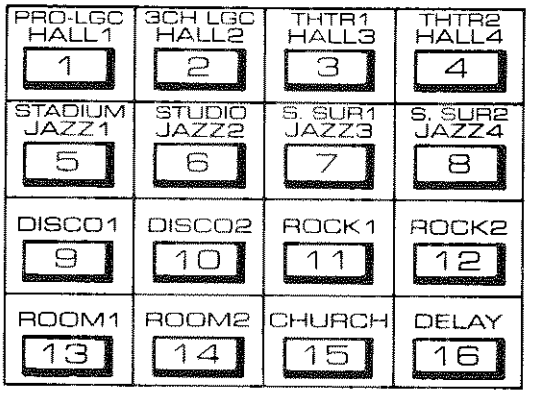


- Processing front, rear, and center signals are not output.

USING SOUND FIELD CONTROL

1. CALLING UP A PROGRAM

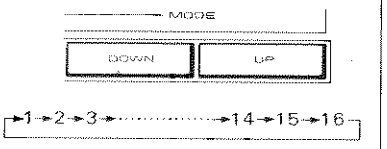
Select the Sound Field Control function, and press a program key on the remote control unit to call up a program. Press the key for the program you want, and the program name is shown on the main unit display.



2. If the processing indicator and equalizer ON indicator are off, then turn them on.

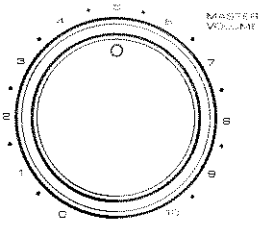
Calling up with the UP/DOWN switches

It's also possible to call up a program using the UP/DOWN switches on the main unit. Press UP for the next program number, and press DOWN for the previous program number.



3. PLAYING A SOURCE

Play the desired source and adjust the volume level with the MASTER VOLUME.



PRESET PROGRAMS

No.	Program name	Features and Most Suitable Sources
1	HALL 1 *	This is a typical large, shoe-box shaped symphony concert hall in Europe, with approximately 1,600 seats.
2	HALL 2	A concert hall in Europe that seats approximately 1,800, with a very wide, spacious sound.
3	HALL 3 *	A 2,000-seat vine yard type concert hall in Japan, equipped with a pipe organ.
4	HALL 4	This is a multi-tiered hall with a very high ceiling, particularly suitable for opera.
5	JAZZ 1	The sound field of a small jazz club with a floor area of about 200m^2.
6	JAZZ 2	Another small club, seats about 200, with a close, more intimate sound.
7	JAZZ 3	This is the sound field of a small jazz club, with a floor area of about 200m^2. The wall opposite the seats is circular and surrounds the stage.
8	Jazz 4 *	A relatively large 600-seat club, this has a sound field similar to that of a small hall.
9	DISCO 1	The sound field of a square disco with the dance floor in the center.
10	DISCO 2	With this sound field, you get the impression of listening to music slightly away from the dance floor. It's a little larger than DISCO 1, with a much more authoritative bass sound.
11	ROCK 1	A famous hall in America, used for various types of concerts. It seats about 2,800.
12	ROCK 2	This sound field gives you the feeling of being in a very large concert hall.
13	ROOM 1 *	This gives you the reverberation of a large listening room.
14	ROOM 2	Ideal for listening to a small ensemble.
15	CHURCH	This is perfect for listening to church music, such as that at a mass.
16	DELAY	Provides added presence for all sources.

* **I.E.R.S mode:** The frequency response of reflected sound varies depending on the properties of the walls, ceiling and floor. Taking advantage of the fact that this is computer simulation, I.E.R.S employs such digital signal processing devices as LPF (Low Pass Filter) to attenuate the higher frequencies of reflected sounds with repeated reflections. This provides reflected sounds very close to those found in real situations

PARAMETER CONTROL

WHAT IS PARAMETER CONTROL?

This processor provides 24 preset programs (16 Sound Field Control, 8 SURROUND) of sound fields ideal for any genre of music and any concert setting. When listening to a music source using the preset programs, however, you may feel that you want a more spacious sound, or a slightly more "live" sound. By changing the parameters (i.e. the elements that make up a sound field) of a preset program, you can create a sound field with the exact qualities you are looking for.

DESCRIPTIONS OF THE DIFFERENT PARAMETERS

The following are the six parameters. (The parameter settings vary depending on the program)

1. INITIAL DELAY

This can be controlled in the Sound Field Control mode.
As shown in fig.(a), the time delay between the direct sound ①, and the first reflected sound ② to reach the ear can be adjusted. This gives you a expansive, spacious sound.

2. ROOM SIZE

This can be controlled in the Sound Field Control mode. (This does not include the HALL 4, ROCK 2, ROOM 2, CHURCH or DELAY programs).
As shown in fig.(a), the delay between the early reflections ②, ③, ④, and ⑤ is adjusted to change the apparent size of the sound field.

3. LIVENESS

This can be controlled in the Sound Field Control mode. (This does not include the HALL 4, ROCK 2, ROOM 2, CHURCH or DELAY programs)
As shown in fig.(a), the decay rate of early reflections, that is, the degree of loss in intensity of ③, ④, and ⑤ compared to ②, is adjusted to recreate the "live" feel of a performance. A slower decay rate gives you a more "live" sound.

4. REVERB TIME

This can be controlled in the HALL 4, ROCK 2, ROOM 2, and CHURCH programs in the Sound Field Control mode.
As shown in fig.(b), subsequent multiple reflections, or reverberations, reach the ear of the listener from all directions. The time it takes for the reverberation sound to decay can be adjusted to change the atmosphere of the acoustic environment for a richer sound.

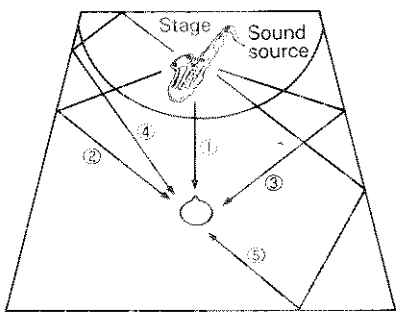
5. H.F.REVERB

This can be controlled in the HALL 4, ROCK 2, ROOM 2, and CHURCH programs in the Sound Field Control mode.
The reverberation time of higher frequencies can be adjusted so that they decay faster than lower frequencies. This produces a sound field with a much more natural feel.

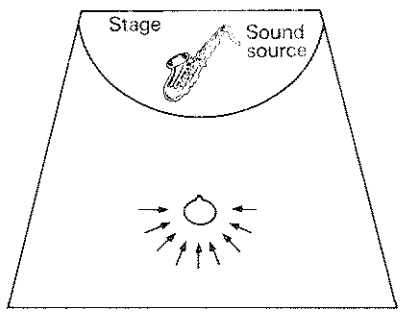
6. P. FRONT EQ, REAR EQ

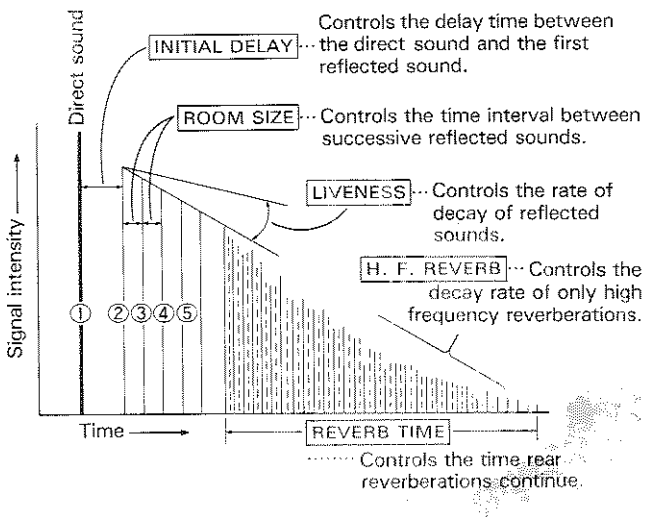
P. FRONT and REAR signal equalization can be carried out regardless of type of program.

(a) Direct sound and first reflected sound

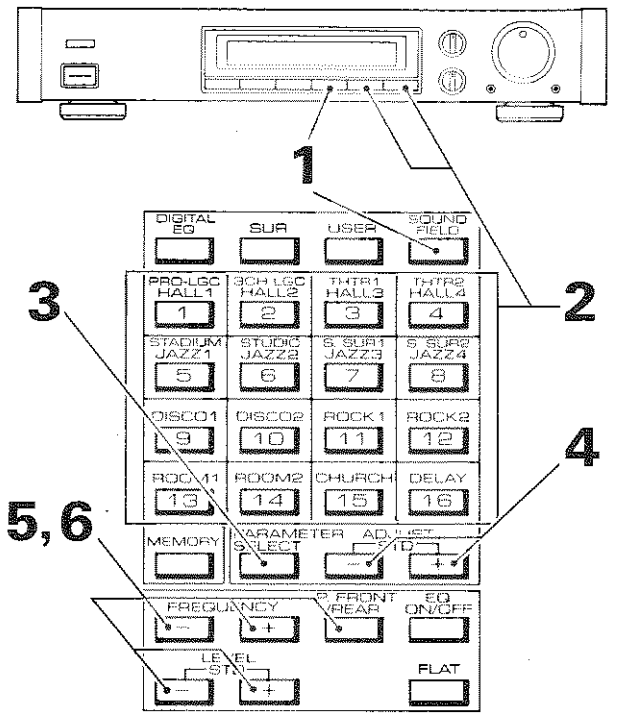


(b) Rear reverberations Sound source Stage




Direct sound
INITIAL DELAY
Controls the delay time between the direct sound and the first reflected sound.
ROOM SIZE
Controls the time interval between successive reflected sounds.
LIVENESS
Controls the rate of decay of reflected sounds.
H. F. REVERB
Controls the decay rate of only high frequency reverberations.
Signal intensity
①②③④⑤
Time
REVERB TIME
Controls the time rear reverberations continue.

CREATING PROGRAMS I (IN THE SOUND FIELD CONTROL MODE)

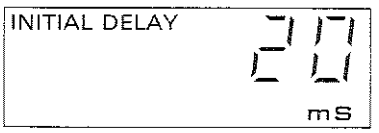


1. **Select the Sound Field Control mode on the main unit or with the remote control unit.**
2. **Call up the desired program with the program key.**
   It's also possible to call up a program using the UP/DOWN switches on the main unit.
   - If the processing indicator and equalizer ON indicator are off, then turn them on.
3. **Call up the parameters you want to change with the PARAMETER SELECT key.**
4. **Press the + or – ADJUST keys, and release when you have reached the desired value. Pressing the + and – keys together returns you to the standard (STD) setting.**
   - When changing functions, be sure to do it slowly.

(1) Adjusting the delay between the direct sound and the first reflection (the apparent distance from the source)

Call up INITIAL DELAY with the PARAMETER SELECT key, and adjust to the most effective value for the music you are listening to.

- Larger values create the effect of being further from the source. Smaller values give the impression of being close to the source, with a very strong sound.



Example: HALL 1
Preset program value is displayed.

IN THE DELAY PROGRAM

FRONT INITIAL DELAY and REAR INITIAL DELAY can be adjusted. Each time you press the PARAMETER SELECT key, the following can be adjusted.

P.FRONT L+R → P.FRONT L → P.FRONT R → REAR L+R → REAR L → REAR R

(2) Adjusting the size of the sound field.

Call up ROOM SIZE with the PARAMETER SELECT key, and adjust with the ADJUST keys. ROOM SIZE is the parameter that decides the size of the sound field. Pressing the – key lowers the value of the setting, for a less spacious sound. Pressing the + key increases the value, giving you a more spacious effect.

Example: HALL 1
Preset program value is displayed.

(3) Adjusting the Liveness

Press the PARAMETER SELECT key to call up the LIVENESS parameter, and then adjust with the ADJUST keys.

Example: HALL 1
Preset program value is displayed

The LIVENESS parameter decides the degree of reverberation. Pressing the – key lowers the value, giving you a weaker reverb effect. Pressing the + key has the opposite effect, giving you a stronger reverb effect.

(4) Adjusting Reverberation Time.

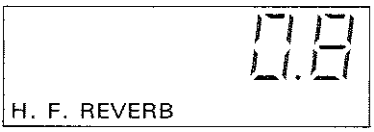
Call up the REVERB TIME parameter with the PARAMETER SELECT key, and adjust with the ADJUST keys.

Example: CHURCH
Preset program value is displayed.

The REVERB TIME parameter decides the reverberation time. Press the – key and the value will decrease, making the reverb time shorter. Press the + key and the value increases, making the reverb time longer.

(5) Adjusting High Frequency Reverberation

Call up the H.F.REVERB parameter with the PARAMETER SELECT key, and adjust with the ADJUST keys.



Example: CHURCH
Preset program value is displayed.

The REVERB TIME parameter decides the reverb time, but the H.F.REVERB parameter decides the reverb time of high frequencies only. Press the - key to lower the value and decrease the reverb time of high frequencies. Press the + key to raise the value, and eventually the decay of high frequencies becomes imperceivable.

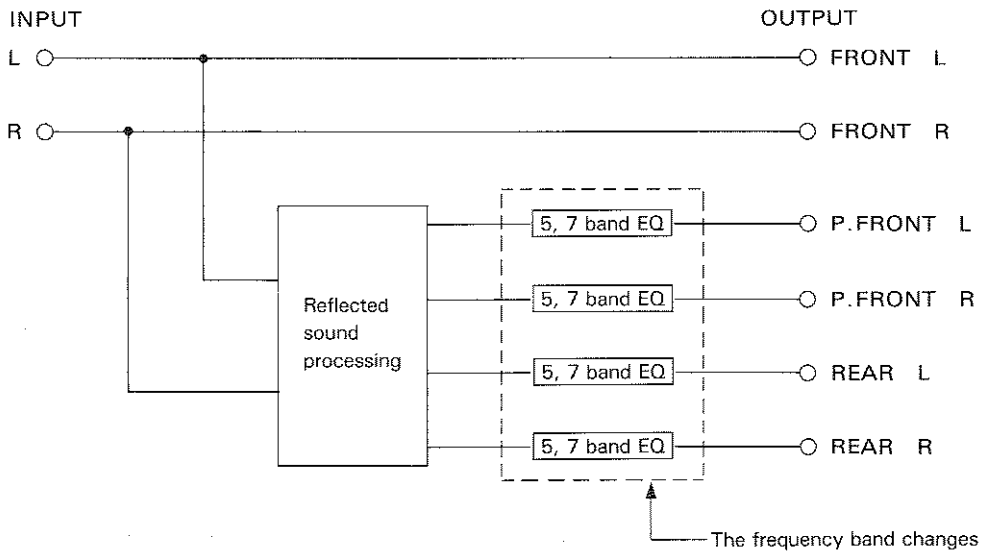
5. Adjusting P.FRONT EQ.

1. Select P.FRONT with the P.FRONT/REAR key on the remote control unit.
2. Select the frequency band with the FREQUENCY (+, −) keys.
3. Set to the desired level with the LEVEL keys.
4. Carry out the same procedures as in 2 and 3 for other frequency bands.

6. Adjusting P. REAR EQ

1. Select REAR with the P. FRONT/REAR key on the remote control unit.
2. Select a frequency with the FREQUENCY (+, −) keys.
3. Set to the desired level with the LEVEL key.
4. Repeat the same procedures as in 2 and 3 for other frequencies

- In the I.E.R.S mode (HALL 1, HALL 3, JAZZ 4, ROOM 1), P.FRONT EQ and REAR EQ changes from 7 Band to 5 Band.
- Be sure to press the PARAMETER SELECT, ADJUST, FREQUENCY (+, −), and LEVEL keys slowly for correct operation.



- The sound field programs are tailored for use with specific types of music. For example, HALL is ideal for classical music, JAZZ for fusion and jazz, etc. When selecting a sound field, always bear in mind the type of music you will be listening to.
- Depending on the type of music and selected sound field program, output from the sound field processor will sometimes sound a little unnatural. For example, HALL settings may cause the bass drum to sound too boomy and prominent. In such cases, select the sound field program that gives the most natural sound, or adjust individual parameters to suit.

- Pressing the + and − LEVEL keys together returns you to the standard (STD) equalization values.

If you call up another program, the parameter settings and equalization levels will be erased, so it is recommended you memorize in a USER program (☞ P.23).

PARAMETER TABLE

No.	Program Name	Parameter Name	Minimum value	Preset Value (STD value)	Maximum value	Effect
1	HALL	INITIAL DELAY	1 ms	← 20 ms →	50 ms	This program only reproduces initial reflections.
		ROOM SIZE	0.1	← 1.0 →	2.5	
	*	LIVENESS	1	← 5 →	10	
2	HALL 2	INITIAL DELAY	1 ms	← 20 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	3.0	
		LIVENESS	1	← 5 →	10	
3	HALL 3	INITIAL DELAY	1 ms	← 20 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	2.2	
	*	LIVENESS	1	← 5 →	10	
4	HALL 4	INITIAL DELAY	1 ms	← 20 ms →	50 ms	This program reproduces initial reflections and rear reverberations.
		REVERB TIME	0.1 s	← 2.0 s →	10 s	
		H.F. REVERB	0.1	← 0.9 →	1.0	
5	JAZZ 1	INITIAL DELAY	1 ms	← 10 ms →	50 ms	This program only reproduces initial reflections
		ROOM SIZE	0.1	← 1.0 →	4.0	
		LIVENESS	1	← 5 →	10	
6	JAZZ 2	INITIAL DELAY	1 ms	← 10 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	4.0	
		LIVENESS	1	← 5 →	10	
7	JAZZ 3	INITIAL DELAY	1 ms	← 10 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	4.0	
		LIVENESS	1	← 5 →	10	
8	JAZZ 4	INITIAL DELAY	1 ms	← 10 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	4.0	
	*	LIVENESS	1	← 5 →	10	
9	DISCO 1	INITIAL DELAY	1 ms	← 10 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	4.0	
		LIVENESS	1	← 5 →	10	
10	DISCO 2	INITIAL DELAY	1 ms	← 10 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	4.0	
		LIVENESS	1	← 5 →	10	
11	ROCK 1	INITIAL DELAY	1 ms	← 20 ms →	50 ms	
		ROOM SIZE	0.1	← 1.0 →	3.5	
		LIVENESS	1	← 5 →	10	
12	ROCK 2	INITIAL DELAY	1 ms	← 20 ms →	50 ms	This program reproduces initial reflections and rear reverberations.
		REVERB TIME	0.1 s	← 2.0 s →	10 s	
		H.F. REVERB	0.1	← 0.8 →	10	
13	ROOM 1	INITIAL DELAY	1 ms	← 10 ms →	50 ms	This program only reproduces initial reflections.
		ROOM SIZE	0.1	← 1.0 →	3.0	
	*	LIVENESS	1	← 5 →	10	
14	ROOM 2	INITIAL DELAY	1 ms	← 20 ms →	50 ms	This program reproduces initial reflections and rear reverberations.
		REVERB TIME	0.1 s	← 1.4 s →	10 s	
		H.F.REVERB	0.1	← 0.8 →	10	
15	CHURCH	INITIAL DELAY	1 ms	← 20 ms →	50 ms	
		REVERB TIME	0.1 s	← 3.0 s →	10.0 s	
		H.F.REVERB	0.1	← 0.8 →	1.0	
16	DELAY	INITIAL DELAY	0 ms	← 25 ms →	99 ms	This program only reproduces the primary reflections from among the initial reflections.

The * mark stands for I.E.R.S mode.

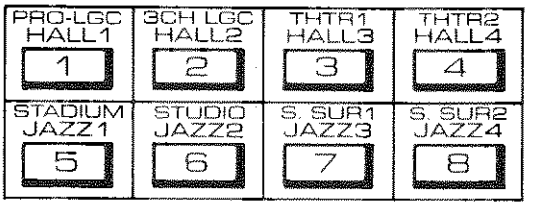
EQUALIZER PRESET VALUE CHART

NO.		Processing equalizer preset (STD) values						
		65Hz	160Hz	400Hz	1kHz	2.5kHz	6.5kHz	12.5kHz
1 HALL 1	P.FRONT	–	−2	0	0	0	0	–
	REAR	–	−2	0	0	0	0	–
2 HALL 2	P.FRONT	−2	0	0	0	0	0	−2
	REAR	−4	0	0	0	0	−2	−2
3 HALL 3	P.FRONT	–	0	0	0	0	−2	–
	REAR	–	−2	0	0	0	0	–
4 HALL 4	P.FRONT	−2	0	0	0	0	0	0
	REAR	−4	0	0	0	0	0	−2
5 JAZZ 1	P.FRONT	0	0	0	0	0	0	0
	REAR	0	0	0	0	0	0	0
6 JAZZ 2	P.FRONT	−2	0	0	0	0	0	−2
	REAR	0	0	0	0	0	0	0
7 JAZZ 3	P.FRONT	0	0	0	0	0	0	0
	REAR	0	0	0	0	0	0	0
8 JAZZ 4	P.FRONT	–	−2	0	0	0	0	–
	REAR	–	−2	0	0	0	0	–
9 DISCO 1	P.FRONT	−2	0	0	0	0	0	0
	REAR	−2	0	0	0	0	0	0
10 DISCO 2	P.FRONT	−2	0	0	0	0	0	−2
	REAR	−4	0	0	0	0	−2	−2
11 ROCK 1	P.FRONT	−2	0	0	0	0	0	0
	REAR	−2	0	0	0	0	0	−2
12 ROCK 2	P.FRONT	−2	0	0	0	0	0	−2
	REAR	−2	0	0	0	0	0	−4
13 ROOM 1	P.FRONT	–	−4	−2	0	0	−2	–
	REAR	–	−6	−2	0	0	−2	–
14 ROOM 2	P.FRONT	−6	−4	0	0	0	0	−2
	REAR	−6	−4	0	0	0	0	0
15 CHURCH	P.FRONT	−6	0	0	0	0	−2	−4
	REAR	−4	0	0	0	0	0	0
16 DELAY	P.FRONT	0	0	0	0	0	0	0
	REAR	0	0	0	0	0	0	0

USING SURROUND MODE

1. CALLING UP PROGRAMS

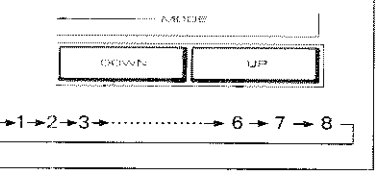
Call up a program by pressing a program key on the remote control unit. Press the desired program key and the program name will be displayed on the main unit.



2. If the processing indicator and equalizer ON indicator are off, then turn them on.

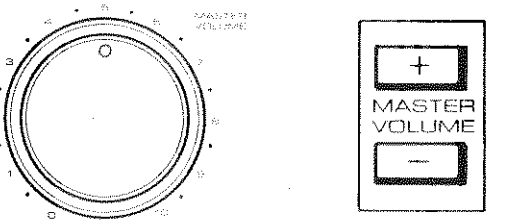
Calling up programs with the UP/DOWN switches

It's also possible to call up programs using the UP/DOWN switches on the main unit. Pressing the UP key calls up the next program number, and pressing the DOWN key calls up the previous program number.



3. PLAYING BACK A SOURCE

Play back a source and adjust the volume level with the MASTER VOLUME.



PRESET PROGRAMS

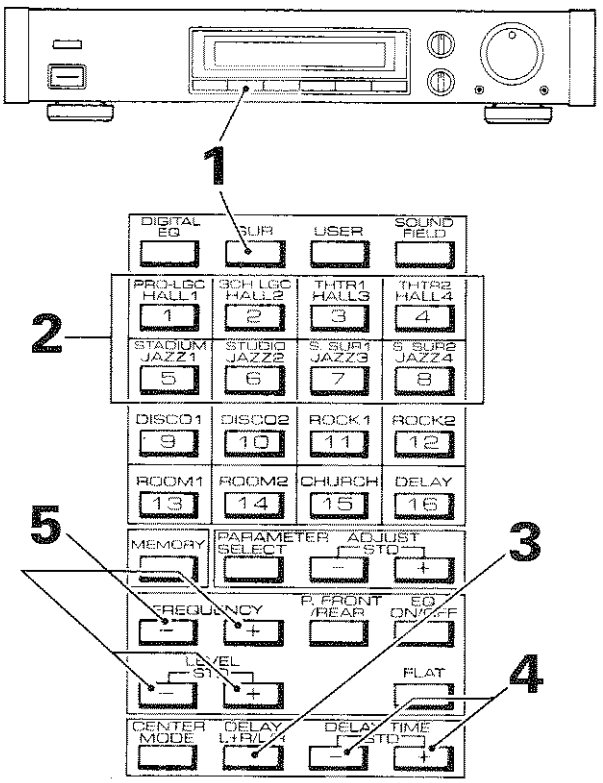
NO.	Pattern	Type of Source			Rear delay	Effect
		DOLBY SURROUND	STEREO	MONO		
1	DOLBY PRO LOGIC SURROUND	○			○	Using circuitry to emphasize directionality for outstanding sound image orientation, this gives you the sound field of a theater or movie theater in your own home.
2	DOLBY 3CH LOGIC	○				This provides the Surround effect with the front three channels (L, R, and CENTER).
3	THEATER 1		○		○	This mode reproduces the atmosphere of a movie theater.
4	THEATER 2		○		○	A movie theater with more reverb than THEATER 1.
5	STADIUM		○		○	The sound field of an outdoor stadium, ideal when listening to rock concerts or sports events.
6	STUDIO		○			This reproduces the sound field of a comparatively small space, such as a studio or small hall. Ideal when listening to musicals or movies containing a lot of music.
7	SIMULATED SURROUND 1		△	○	○	For a surround effect with monaural sources.
8	SIMULATED SURROUND 2		△	○	○	This mode provides more reverb than SIMULATED SURROUND 1.

Center Mode Choices:

• **OFF** — Set to this position for PRO LOGIC CENTER SPEAKER level balance adjustment. (See page 13.)
(When using a center speaker:)
• **NORMAL** — Low range frequencies, which have little effect on directionality and positioning, are routed to the left and right front speakers. So you can use a relatively small size speaker as the center speaker.
• **WIDE** — If you use a large size center speaker, choose this setting. The full frequency range of the Dolby Surround center channel, from low to high, is routed to the center speaker.
(When not using a center speaker:)
• **PHANTOM** — The signal which would have been sent to the center speaker is divided equally between the left and right front speakers.

CREATING PROGRAMS II (IN THE SURROUND MODE)

Only the DELAY TIME and REAR EQ parameters can be controlled in the SURROUND mode. (DELAY TIME cannot be controlled in the DOLBY 3CH LOGIC and STUDIO programs).



1. Select SURROUND on the main unit or with the remote control unit.

2. Call up the desired program with a PROGRAM key.

It's also possible to call up a program using the UP/DOWN switches on the main unit.

- If the processing indicator and equalizer ON indicator are off, then turn them on.

3. Press the DELAY L+R/L/R key.

Each time you press it, it will change from L and R, to just L, and then to just R, so you can adjust L and R together or separately.

- In the DOLBY PRO LOGIC SURROUND and THEATER programs, L and R are adjusted independently, and in the in the STADIUM and SIMULATED SURROUND programs L and R are adjusted at the same time.

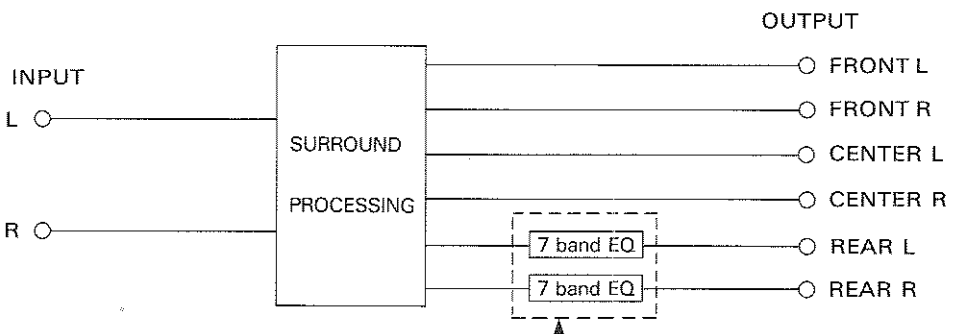
4. Continue pressing the + or – DELAY TIME key until you reach the desired value, and then release.

Pressing both + and – keys together takes you back to the standard (STD) value.

5. Adjusting the REAR EQ (Adjustment of FRONT is not possible)

1. Select the frequency band with the FREQUENCY (+, –) keys.
2. Set to the desired level with the LEVEL keys.
3. Carry out the same procedures as in 1 and 2 for other frequencies bands.

* REAR is not used with DOLBY 3CH LOGIC, so EQ adjustment is not possible.



- In SURROUND, the standard values are all flat (0).
- Pressing the + and – keys together returns the equalizer patterns to the standard (STD) values.

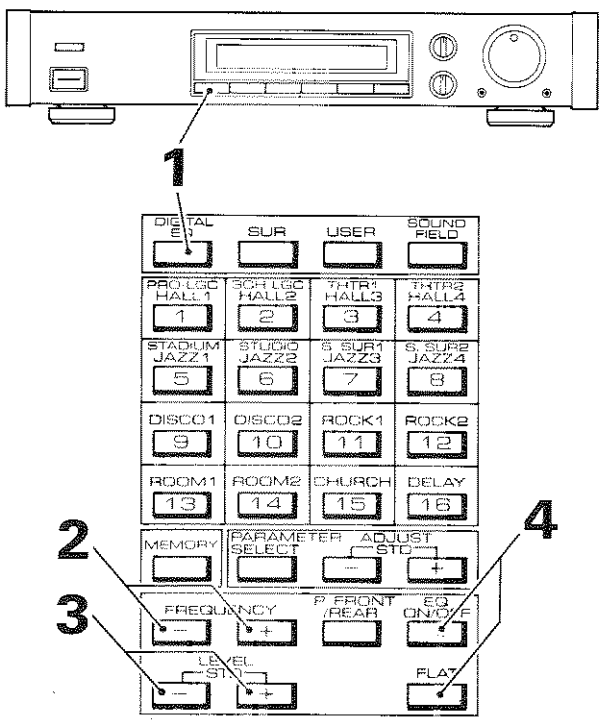
PARAMETER TABLE

The parameters are only delay time.

No.	Program Name	Preset Value (STD value)		Maximum	Effect
1.	DOLBY PRO LOGIC SURROUND	15 ms	← 20 ms →	30 ms	Adjusts the time until the surround sound is produced
3.	THEAT. 1	1	← 20 (40) ms →	60 ms	
4.	THEAT. 2	1	← 20 (40) ms →	60 ms	
5.	STADIUM	1	← 40 ms →	60 ms	
7.	SIM-SUR 1	1	← 40 ms →	60 ms	
8.	SIM-SUR 2	1	← 40 ms →	60 ms	
Adjustment of 2. DOLBY 3CH LOGIC and 6. STUDIO is not possible.			NOTE: Numbers in the parentheses are the values of Right channel.		

* When adjusting the delay time of left and right channels together when they are set to different values, if one of the channels reaches the maximum value, the value for the delay of the other channel cannot be raised further. If it reaches the minimum value, the value for the delay of the other channel cannot be lowered further.

HOW TO USE THE DIGITAL EQUALIZER



1. Select DIGITAL EQUALIZER on the main unit or with the remote control unit (If the EQUALIZER ON indicator is off, press the EQ ON/OFF key on the remote control unit to light).

You can equalize 7 separate frequency bands, covering the full range of frequencies.

2. Select the frequency band you want to equalize with the (+) or (–) FREQUENCY keys.

The selected frequency band will flash on the display. Press the (+) key to move to a higher frequency band, and the (–) key to move to a lower frequency band.

3. When you have decided on a frequency band, set to the desired value with the (+) or (–) LEVEL keys.

You can select a value from – 12 dB to + 12 dB.

4. To listen without equalization, press the EQ ON/OFF key.

If you want to return to the original values after you have made changes, press the FLAT key and the values for all frequencies will return to 0.

• Be sure to press the FREQUENCY (+, –), and LEVEL keys slowly for correct operation.

• When using the digital equalizer, there is no function to return the equalizer patterns to the standard values.

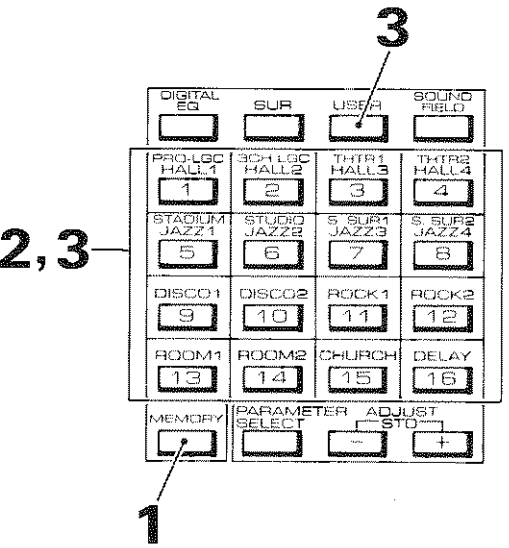
HOW TO USE THE USER PROGRAM MEMORY

1. After adjusting the parameters and other controls, press the MEMORY key.

A few seconds after pressing the key, MEMORY will be displayed, and the * mark will flash.

2. While the MEMORY ✳ mark is flashing, press one of the 16 program keys for the desired program.

If the mark stops flashing, press the MEMORY key again.



3. To call up a program in the memory, press the USER key and then press a program key for the desired program.

- An original program with altered parameters and digital equalizer settings is stored in the memory under the program key pressed. If the program key is pressed after the * mark stops flashing, all the previous settings for the program will be erased. Be sure to check that the mark is flashing before pressing the program key.

- Up to 16 (1 to 16) programs can be stored in memory. If a program is memorized under a number that already holds a program, the previous program will be erased.
  (When the unit leaves the factory, the user programs in memory are exactly the same as the Sound Field Control preset programs)

- Parameters, EQ ON/OFF, PROCESSING ON/OFF, and REAR LEVEL, CENTER LEVEL, REAR EQ LEVEL control values in the SURROUND mode are memorized. PROCESSING LEVEL, PROCESSING FRONT LEVEL, PROCESSING FRONT and REAR EQ LEVEL control values in the Sound Field Control mode are also memorized.
  To call up a memorized program, press the USER key and then press the appropriate program key, or use the DOWN/UP switches on the main unit.

THE MEMORY FUNCTION

Program settings will be retained in memory for up to about 5 years. If a preset memory has been erased, consult with a Pioneer authorized service station.

RECORDING WITH A CASSETTE DECK

When recording with a cassette deck connected to the TAPE jack of this unit.

1. Start play of an audio source.

2. Load the cassette deck to be used for recording with a tape and record.

- Refer to the cassette deck's instructions manual for details concerning operation.
- With this unit, the sound provided by Sound Field Control cannot be recorded.

TROUBLESHOOTING

Incorrect operations are often mistaken for trouble and malfunction. If you think that there is something wrong with this component, check the points below. Sometimes the trouble may lie in another component. Investigate the other components and electrical appliances being used.
If the trouble cannot be rectified even after exercising the checks listed below, ask your nearest PIONEER authorized service center or your dealer to carry out repair work.

Symptom	Cause	Remedy
Power does not come on.	• The power cord plug is not properly plugged into the power outlet. • The power cord plug is plugged into the amp, but there is no power from the amp.	• Carefully plug the power cord plug into the wall outlet. • Switch on the power to the amp.
No sound	• The INPUT LEVEL is turned down. • The MASTER VOLUME is turned all the way to the left. • Incorrect connection of speaker cords of amp. • Connecting cord jacks are not firmly inserted or are loose, or the connections are wrong. • The jacks or cord pin plugs are dirty. • Incorrect operation of the amp's volume control, muting, speaker switches etc. • Muting is on.	• Turn the knob to the right for the desired volume level. • Turn the knob to the right for the desired volume level. • Connect correctly. • Check connections. • Clean jacks and pin plugs. • Refer to the amp's instructions manual. • Press the MUTE key to cancel muting.
The sound is distorted.	• The main unit's MASTER VOLUME is adjusted too high, or the amp volume is too low. • When using a source with a wide dynamic range, there is too much boost on the graphic equalizer setting.	• When the main unit is connected to an integrated amp, the MASTER VOLUME on the main unit should be set to a position less than 12 o'clock. • Lower the input level with the INPUT LEVEL knob.
No sound from one speaker.	• The connecting cord or speaker cord is disconnected. • Incorrect balance adjustment.	• Check connections. • Return to the center position.
The tape doesn't record.	• Incorrect operation of the cassette deck.	• Refer to the tape deck's instructions manual.
No sound from the rear speakers	• The PROCESSING switch is OFF. • With a monaural audio input, a mode other than SIMULATED SURROUND is being used.	• Switch PROCESSING ON. • Switch SIMULATED SURROUND ON.
No sound from the Processing Front Speakers	• The rear panel Sound Field System is on the 4CH side.	• Put the selector to the 6CH side.
Remote control operation is not possible.	• Wrong distance or angle. • There is an obstacle between the remote control unit and the main unit. • The batteries are dead.	• The remote control unit will function from a maximum range of 7 meters, no more than 30 degrees off-axis from the unit's front panel. • Remove the obstacle or change the position of the unit. • Replace the batteries.

- If the indicator doesn't light, or operation switches fail to function when pressed, even when the power is switched on, disconnect the power cord from the power outlet, wait for about 10 seconds, reconnect, and switch on the power again.

- When you use this unit with a TV or tuner at the same time, noise may be generated due to radio interference, but this will not damage the TV or this unit. To avoid this problem, it is recommended you place this unit, the TV, and the tuner as far apart as possible. The same applies to antenna cords, and AC cords, which should be placed as far away as possible from any of this unit's cords.

SPECIFICATIONS

Amplifier section

Distortion at 1 kHz
FRONT (When without using DOLBY PRO LOGIC) ..... 0.002 %
PROCESSING FRONT, REAR ..... 0.006 %

Input jacks (Sensitivity/Input Impedance)
INPUT ..... 150 mV/41 kΩ

Output jacks (Output level/Impedance)
FRONT OUT ..... 1 V/1 kΩ

Frequency response
FRONT (When without using DOLBY PRO LOGIC) 5 to 100 kHz $^{+0}_{-3}$ dB
PROCESSING FRONT, REAR..... 20 to 20 kHz $^{+0}_{-3}$ dB

SN Ratio (IHF, short circuited, A network), S = 2 Vrms
PROCESSING FRONT, REAR ..... 90 dB

Miscellaneous

Power supply voltage ..... AC120 V, 60 Hz
Power consumption (Electrical appliance control law) ..... 32 W
AC Outlets ..... Unswitched: 1 (500 W)
External dimensions ..... 456 (W) x 92 (H) x 335 (D) mm
18 (W) x 4 (H) x 13 (D) in
Weight ..... 6.0 Kg (13 lb 4 oz)

Accessories

Audio cord with pin plug 4
Remote control unit 1
Dry cell battery (Size AAA, R03/UM-4) 2
Warranty 1
Operating Instructions 1

- The above specifications and external features may change without notice due to modifications.

MAINTENANCE OF EXTERNAL SURFACES

- Use a polishing cloth or dry cloth to wipe off dust and dirt.
- When the surfaces are very dirty, wipe with a soft cloth dipped in some neutral cleanser diluted five or six times with water, and wrung out well, and then wipe again with a dry cloth. Do not use furniture wax or cleaners.
- Never use thinners, benzine, insecticide sprays and other chemicals on or near this unit, since these will corrode the surfaces.

POWER-CORD CAUTION

Handle the power cord by the plug. Do not pull out the plug by tugging the cord and never touch the power cord when your hands are wet as this could cause a short circuit or electric shock. Do not place the unit, a piece of furniture, etc., on the power cord, or pinch the cord. Never make a knot in the cord or tie it with other cords. The power cords should be routed such that they are not likely to be stepped on. A damaged power cord can cause fire or give you an electrical shock. Check the power cord once in a while. When you find it damaged, ask your nearest PIONEER authorized service center or your dealer for a replacement.

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